

ATTACHMENT 2

GRANT & HACKH'S  
**CHEMICAL  
DICTIONARY**

*[American, International, European and British Usage]*

*Containing the Words Generally Used in Chemistry,  
and Many of the Terms Used in the Related  
Sciences of Physics, Medicine, Engineering,  
Biology, Pharmacy, Astrophysics,  
Agriculture, Mineralogy, etc.*

*Based on Recent Scientific Literature*

FIFTH EDITION

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**McGRAW-HILL BOOK COMPANY**

*New York St. Louis San Francisco Auckland Bogotá  
Hamburg Johannesburg London Madrid Mexico  
Milan Montreal New Delhi Panama  
Paris São Paulo Singapore  
Sydney Tokyo Toronto*

Library of Congress Cataloging-in-Publication Data

Hackh, Ingo W. D. (Ingo Waldemar Dagobert), 1890-1938.  
Grant & Hackh's chemical dictionary.

Rev. ed. of: Chemical dictionary. 4th ed. 1969.

I. Chemistry—Dictionaries. I. Grant, Roger L.  
II. Grant, Claire. III. Title. IV. Title: Grant &  
Hackh's chemical dictionary. V. Title: Chemical  
dictionary.

QD5.H3 1987 540'.3 86-7496  
ISBN 0-07-024067-1

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1234567890 DOCDOC 8943210987

ISBN 0-07-024067-1

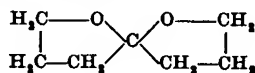
The previous edition of this book was *Hackh's Chemical Dictionary*,  
4th ed., published by McGraw-Hill in 1969. It was prepared by Dr.  
Julius Grant from a *Chemical Dictionary* compiled by Ingo W. D.  
Hackh. The current, or 5th, edition of this book was prepared by Dr.  
Roger L. Grant, whose father prepared the 4th edition.

*The editors for this book were Betty J. Sun and Susan Thomas,  
the designer was Naomi Auerbach, and the production  
supervisor was Teresa F. Leaden. It was set in Palatino  
by University Graphics, Inc.*

*Printed and bound by R. R. Donnelley & Sons Company.*

**oxethyl** Ethylol. The 2-hydroxyethyl radical,  $\text{CH}_2\text{OH} \cdot \text{CH}_2 \cdot$ . Cf. *ethoxy*.

**oxetone**  $\text{C}_7\text{H}_{12}\text{O}_2 = 128.2$ . 1,6-Dioxaspiro[4.4]nonane. The heterocyclic spiro compound



**Oxford process** The separation of nickel from copper by means of sodium sulfide. Cf. *Mond process*.

**oxgall** Bile from the gallbladder of oxen; used in the textile and printing industries.

**oxid** Oxide\*.

**oxidase\*** See *enzymes*, Table 30.

**oxidation** Originally, o. meant combining with oxygen; later it also indicated combination with electronegative elements. Now it has a broader meaning: an augmentation of the valence number of an ion or atom as the result of the loss of one or more electrons, thereby making it more electropositive. Cf. *hydroxylation, reduction*. **o. base** A dye produced by oxidative means; as, nigrosine. **o. number\*** The o. n. of an element in any chemical entity is the charge which would be present on an atom of the element if the electrons in each bond to that atom were assigned to the more electronegative atom. Thus, for  $\text{MnO}_4^-$ , the o. n. of Mn is VII; that of O is -II. For  $\text{CH}_4$ , the o. n. of C is -IV; that of H is I. Rules consider: (1) H as positive in combination with nonmetals; (2) organic radicals as anions; (3) the groups NO and CO as neutral; (4) a bond between atoms of the same element to make no contribution to the o. n. Where doubt may exist, the o. n. should be shown by Stock nomenclature, q.v. For o. n. (or o. states) of the elements, see *electron configuration* (under *electron*), Table 27. Cf. *valency*. **o. process** A reaction that increases the proportion of oxygen or acid-forming elements or radicals in a compound. **o. reaction** Electronation reaction. A reaction accompanied by a correlated reduction in the valence number of another element. **o.-reduction indicators** See *oxidation-reduction indicator* under *indicator*. **o.-reduction potential**  $r_H$ ,  $r_H$ . Redox potential. The potential acquired by an inert electrode, e.g., platinum, immersed in a reversible oxidation-reduction system, e.g.,  $\text{Fe}^{++}/\text{Fe}^{3+}$ ; measured by the ratio of the oxidized and reduced forms.  $r_H = \log 1/pH_2$ , where  $pH_2$  is the hydrogen gas pressure. **o. state** The degree of oxidation corresponding to a given o. number, q.v. **o. value** A constant of oils. The degree of oxidation (as grams of I per 100 g sample) when a fat dissolved in carbon tetrachloride is oxidized by potassium dichromate in glacial acetic acid.

**oxidative coupling** The formation of a high-molecular-weight polymer when an organic compound with activated hydrogens reacts catalytically with an oxidizing agent.

**oxide** (1) A binary compound of oxygen generally with a metal,  $\text{M}_2\text{O}$  (basic), or nonmetal,  $\text{NO}_x$  (acidic), containing the anion  $\text{O}^{2-}$ . (2) Used instead of "ether" in some languages.

**acid** ~ An oxygen compound of nonmetals; as,  $\text{SO}_2$ ,  $\text{P}_2\text{O}_5$ , which give oxyacids with water. **amphoteric** ~ An oxygen compound of the heavy metals; as,  $\text{ZnO}$ ,  $\text{Fe}_2\text{O}_3$ , which may form weak acids and weak bases. **basic** ~ An oxygen compound of metals; as,  $\text{Na}_2\text{O}$ ,  $\text{Al}_2\text{O}_3$ , which give bases with water. **hydrous** ~ An amorphous colloidal substance, which is neither a definite hydroxide nor a definite crystalline hydrate. **inert** ~ An oxygen compound which forms neither acid nor basic compounds, as CO,  $\text{N}_2\text{O}$ . **metal-modified** ~ A refractory made by adding small amounts of refractory metals to refractory oxides. **per** ~ See *peroxide*. **primary** ~ See *primary oxide*. **sub** ~ See *suboxide*.

**oxidimetry** The use of an oxidizing agent in volumetric analysis.

**oxidize** To cause to unite with oxygen; to increase the proportion of electronegative elements or radicals.

**oxidizer** Oxidizing agent.

**oxidizing** The act of oxidation. **o. agent** A substance that (1) yields oxygen readily, (2) removes hydrogen from a compound, or (3) attracts negative electrons; e.g.: the common oxidizing agents are  $\text{O}_2$ ,  $\text{O}_3$ ,  $\text{Cl}_2$ ,  $\text{KMnO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{KClO}_3$ ,  $\text{HNO}_3$ ,  $\text{H}_2\text{O}_2$ . **o. flame** The outer zone of a gas flame containing an excess of air. Cf. *reducing flame*. **o. reaction** See *oxidation*.

**oxidoreductases\*** See *enzymes*, Table 30 on p. 214.

**oxidoreduction** See *oxidation-reduction potential*.

**oxime\*** Hydroxyimino\*. A compound (cis or trans) containing the o. radical,  $=\text{C}:\text{N}:\text{OH}$ ; a condensation product of aldehydes or ketones with hydroxylamine. See *aldoximes*, *acet* ~ See *acetoxime*. *ald* ~ See *aldoxime*. *amid* ~

*Amide oxime\**. A compound containing 2 o. radicals. *dimethylidi* ~ Dimethylglyoxime\*. *form* ~ See *nitrolic acid*. *glucose* ~ See *glucose oxime*. *lact* ~ See *lactoxime*.

**oximide**  $(\text{CO})_2\text{NH} = 71.0$ . The imide of oxalic acid.

Colorless prisms obtained from oxamic acid by dehydration. *cyan* ~ See *cyanoximide*.

**oximido** The oxime\* group.

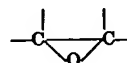
**oximinoketone** A compound of the type  $\text{R} \cdot \text{CO} \cdot \text{C}:\text{NOH}$ , which gives a blue color with ferrous iron.

**oxine** 8-Quinolinol\*. *thio* ~ 8-Mercaptoquinoline.

**oxindole**  $\text{NH} \cdot \text{C}_6\text{H}_4 \cdot \text{CH}_2 \cdot \text{CO} = 133.2$ . 2-Indolinone, 2-

oxindoline. Colorless needles, m. 126, soluble in hot water.

**oxirane** (1)\* Ethylene oxide\*. (2) Epoxide. Describing the oxygen atom of the epoxide ring.



**methyl** ~ Epoxypropane.

**oxirene**  $\text{CH}:\text{CH}:\text{O}$ . **methyl** ~ 1,2-Epoxypropene\*.

**oxo** (1)\* Prefix indicating the  $=\text{O}$  group; as, in aldehydes and 2-oxopropanoic acid,  $\text{MeCO} \cdot \text{COOH}$ . (2)\* Infix indicating the anionic ligand  $\text{O}^{2-}$ . **o. acids** (1)\* Acids containing an o. group, as, phosphonic acid,  $\text{HP}(\text{O})(\text{OH})_2$ . (2) Ketone acids.

**1-o.butyl†** See *butyryl*. **o. compounds** Compounds having an o. group, excluding carboxylic acids. See under element; as, oxovanadium ions. **1-o.decyl†** See *decanoyl*. **1-o.9-octadeceny†** See *oleoyl*. **1-o.pentyl†** See *valeryl*. **o. process**,

**o. reaction** The manufacture of alcohols by catalytically reacting an olefin with water-gas under pressure and reducing the resulting aldehyde:  $\text{C}_2\text{H}_4 \rightarrow \text{CH}_2 \cdot \text{CHO} \rightarrow \text{CH}_3 \cdot \text{CH}_2 \cdot \text{CH}_2\text{OH}$ . If carbon monoxide and water are used, an acid results. **1-o.2-propeny†** See *acryloyl*.

**oxomalonic acid** Mesoxalic acid\*.

**oxomonocyanogen**  $\text{CNO} = 42.2$ . Oxam. A gas prepared by heating cyanogen in oxygen.

**Oxone** Trademark for a bleaching preparation, whose active constituent is potassium peroxosulfate.

**oxonite** An explosive: picric acid dissolved in nitric acid.

**oxonium** **o. compounds** An addition or double compound of an organic oxide with strong acids or their salts; as,  $[\text{Me}_2\text{OH}]\text{Cl}$ , dimethyl oxonium chloride. **o. ion\***  $\text{H}_3\text{O}^+$ . The monohydrated proton.

**oxophenic acid** Pyrocatechol\*.

**Oxsoralen** Trademark for methoxsalen.